PATENT ABSTRACTS OF JAPAN

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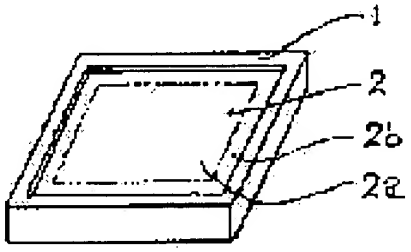
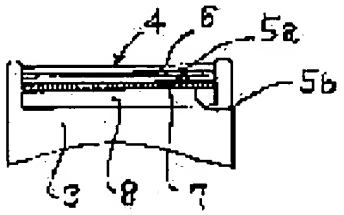
(71)Applicant : GUNZE LTD
(72)Inventor : OKABE MINORU
MUROKI
YUKINOBU

(54) TRANSPARENT TOUCH PANEL STRUCTURE

(57)Abstract:
PURPOSE: To prolong the life of a transparent touch panel and provide good visible property of a display part by carring out the whole surface sticking of the transparent touch panel which is to be stuck to a display panel.
CONSTITUTION: An input apparatus 1 is provided with a display part 3 and the surface 2 of the display part 3 can be divided into a center part 2a and a frame side part 2b. The display part 3 is composed of a liquid crystal display and covered with a surface supporting body 8 and the whole surface of a transparent touch panel 4 is stuck to the surface supporting body





8 with a substrate- free acrylic adhesive 7. Since the whole surface sticking of the transparent touch panel 4 is done using the acrylic adhesive with good transparent property, no space is formed between the transparent plates or transparent films and thus the display part of an input apparatus can provide good visibility.

LEGAL STATUS

[Date of request for examination]	01.03.1999
[Date of sending the examiner's decision of rejection]	
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[Date of final disposal for application]	
[Patent number]	3112345
[Date of registration]	22.09.2000
[Number of appeal against examiner's decision of rejection]	
[Date of requesting appeal against examiner's decision of rejection]	
[Date of extinction of right]	25.02.2002

2

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CLAIMS

[Claim(s)]
[Claim 1] Structure of the transparence touch panel characterized by pasting up completely with the transparence plate or bright film which sticks and is used on the imprint tape which consists of an acrylic binder without a base material in the transparence touch panel which prepared the transparent conductive thin film in the field where a transparent ****** substrate counters, and was formed through the spacer

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[Translation done.]

3

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] TTP is used about the transparence touch panel (it is displayed as Following TTP) used combining indicating equipments, such as a liquid crystal display and a plasma display, etc. as various kinds of human interface devices (example: program-controller control panel etc.) by being combined with a liquid crystal display, a plasma display, etc. in the condition of sticking with a color film, polarization material, etc. for the glass plate for configuration support, the PORIKA plate, or the tendency to heighten the added value of TTP.
[0002]
[Description of the Prior Art] TTP4 used combining a display etc. is used for the front face 2 of the display 3 of the input unit 1 with a display, combining, as shown in drawing 1 and drawing 2 . Frame flank 2b of a front face 2 is a non-visible region, and center-section 2a is a visible region. The display of a switch etc. is prepared in the display 3 corresponding to center-section 2a, and required data can be inputted into it when an operator presses TTP in the location according to the display of a switch etc.
[0003] Laminating formation of the transparence ****** substrates 5a and 5b which have the 1-set flexibility of two sheets which prepared the transparent conductive thin film in the field which counters was carried out through the spacer 6, TTP4 carried out printing spreading of the adhesion ink 9 only at frame flank 2b which is a non-visible region, as conventionally shown in drawing 3 , and it was stuck on the surface base material 8 of a display 3. This was consideration for indicating a display 3 legible, and when it pasted up completely, the problem was in the transparency of TTP. That is, the ingredients for adhesion

(ink etc.) were not used for center-section 2a which is a visible region.
[0004]
[Problem(s) to be Solved by the Invention] Since a distortion unnecessary for TTP was generated when TTP was not completely pasted up on the transparence plate or bright film of surface base material 8 grade of a display, and a clearance existed between TTP, a transparence plate, or a bright film, it inputted by TTP and TTP was pressed, there was a problem of shortening the life of the thin film of TTP. Moreover, the Newton ring etc. is generated, there is also a problem of being easy to spoil transparency, and non-glare processing needed to be performed on the surface of TTP for Newton ring prevention.
[0005] Since there is a problem also in the transparency of adhesives and it was easy to generate nonuniformity also in the method of application when adhesives were applied all over TTP and complete adhesion was performed, the transparency of TTP was spoiled in many cases.
[0006] In case TTP is used for the place made into the purpose of this invention combining a display etc., it is offering the structure of TTP which makes it possible to paste up all over the transparence plate which sticks with TTP and is used, or a bright film, is not made to generate a distortion unnecessary for TTP at the time of press, and does not spoil the transparency of TTP, either.
[0007]
[Means for Solving the Problem] In the transparence touch panel which prepared the transparent conductive thin film in the field where a transparent ****** substrate counters, and carried out laminating formation through the spacer, this invention is the imprint tape which consists of an acrylic binder without a base material, and is characterized by pasting up completely with the transparence plate or bright film which sticks and is used.
[0008]
[Function] the acrylic binder in which TTP concerning this invention does not have not the printing technique but a base material -- it is -- quantity -- since the transparence plate or the bright film is completely pasted using the imprint tape which is a transparent double-sided binder, an unnecessary distortion is not generated even if pressed. Moreover, since a clearance is not made between a transparence plate, a bright film, and TTP, the Newton ring is not generated. Furthermore, since it is an acrylic binder, the transparency of TTP is not spoiled.
[0009]
[Example] Next, this invention **** 1 example is explained based on a drawing. Drawing 1 is the whole input unit 1 perspective view which has the display 3 using TTP4 concerning this invention, and drawing 2 is this sectional view. An

input unit 1 is equipped with a display 3 as described above, and the front face 2 of a display 3 is distinguished by center-section 2a and frame flank 2b. The display 3 consists of liquid crystal DIPUREI, it covers with the surface base material 8, and TTP4 is completely stuck with the acrylic binder 7 which does not have a base material in the surface base material 8.

[0010] TTP4 carries out sputtering of the ITO (in JUMU tin) thin film to one [which has the flexibility which consists of a transparent polyethylene terephthalate film] field of the ****** substrates 5a and 5b, forms it in it, prints the dot spacer 6 of a minor diameter (several micro-50micro) on the ITO thin film of one ****** substrate 5b, makes it counter with the field of the ITO thin film of ****** substrate 5a of another side, and carries out a laminating. Thermocompression bonding of behind a laminating has been carried out in the part equivalent to frame flank 2b.

[0011] The surface base material 8 is built into the display 3 of an input unit 1, after it consists of a glass plate with sufficient transparency and TTP4 pastes up on the surface of one side. The quality of the material of this base material 8 may not be restricted to a glass plate, and may be resin plates, such as a polycarbonate with sufficient transparency, etc.

[0012] the quantity from which the acrylic binder 7 without a base material was protected with the exfoliation films 9a and 9b in both sides as shown in drawing 4 -- it is a transparent double-sided binder, and since it is not used as an imprint tape and the base material is not used, it has high transparency. Furthermore, since it is acrylic resin, it excels also in an adhesive property and has high peel strength. For example, the "Scotch whisky" mark quantity transparence binder imprint tape #9483 grade currently sold from Sumitomo 3M, Inc. is desirable.

[0013] The lamination procedure of the acrylic binder 7 without the base material protected with the exfoliation films 9a and 9b in both sides is shown in drawing 5 - drawing 8 . Drawing 5 uses 1 set of nip rolls 10 and 10, and it shows the procedure of sticking and setting this binder 7 by surface ****** 8, exfoliating one exfoliation film 9b of the acrylic binder 7. That is, the acrylic binder 7 is stuck on the surface base material 8 by passing nip rolls 10 and 10, exfoliating exfoliation film 9b at the superposition nip rolls 10 and 10 to compensate for rotation of ********** and nip rolls 10 and 10 in the acrylic binder 7 in the surface base material 8, where [of exfoliation film 9b] an edge is removed on the other hand.

[0014] Drawing 6 holds the surface base material 8 by the suction chuck 11, and shows the pasted-up procedure which carries out a pressure welding with the press roll 12. The acrylic binder 7 is stuck on the surface base material 8 by

6

carrying out a pressure welding, exfoliating exfoliation film 9b at the superposition press roll 12 to compensate for rotation of ********** and the press roll 12 in the acrylic binder 7 in the surface base material 8 also at this time, where [of exfoliation film 9b] an edge is removed on the other hand.

[0015] Drawing 7 shows the procedure which sticks TTP4 on the surface base material 8 through the acrylic binder 7 with nip rolls 10 and 10, and is united. TTP4 is stuck on the surface base material 8 through the acrylic binder 7 by [of exfoliation film 9a of another side of the acrylic binder 7 stuck on the surface base material 8] passing nip rolls 10 and 10, removing an edge on the other hand and exfoliating exfoliation film 9a to compensate for rotation of ********** and nip rolls 10 and 10 in nip rolls 10 and 10 with TTP4. Since it sticks on coincidence and exfoliation film 9a is united with it, exfoliating, there is no fear of facing sticking and uniting and adhering [Chile / paper powder,].

[0016] Moreover, drawing 8 uses the suction chuck 11 and the press roll 12, and shows the procedure which sticks TTP4 on the surface base material 8. TTP4 is stuck on the surface base material 8 by pressing exfoliating exfoliation film 9a to compensate for rotation of ********** and the press roll 12 on the superposition press roll 12 in TTP4, where [of exfoliation film 9a of the acrylic binder 7 with which it was stuck on the surface base material 8 also at this time] an edge is removed on the other hand.

[0017] Also in which procedure, since it sticks at the same time it exfoliates an exfoliation film, it is possible for neither Chile nor paper powder to adhere, to stick beautifully, and to unite.

[0018] What is necessary is just the transparence plate which is not restricted to this although TTP stuck on the surface base material which consists of a glass plate in this example is shown, can apply even if it is the film stuck on protection on the surface of TTP, or the polarization sheet stuck on a front face, sticks with TTP, and is used, or a bright film.

[0019]

[Effect of the Invention] Since use an acrylic binder with sufficient transparency, a crevice is lost between TTP, a transparence plate, or a bright film since complete adhesion of TTP is performed, the Newton ring etc. is not generated and the transparency of TTP is not spoiled, the display of an input unit can check by looking beautifully. Moreover, without a wave occurring in TTP, since it has pasted up completely even if the size of TTP becomes large, a distortion unnecessary at the time of press is not generated, either, but the effectiveness that the life of TTP also becomes long is done so.

7

[Translation done.]

* NOTICES *

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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

TECHNICAL FIELD

[Industrial Application] TTP is used about the transparence touch panel (it is displayed as Following TTP) used combining indicating equipments, such as a liquid crystal display and a plasma display, etc. as various kinds of human interface devices (example: program-controller control panel etc.) by being combined with a liquid crystal display, a plasma display, etc. in the condition of sticking with a color film, polarization material, etc. for the glass plate for configuration support, the PORIKA plate, or the tendency to heighten the added value of TTP.

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PRIOR ART

[Description of the Prior Art] TTP4 used combining a display etc. is used for the front face 2 of the display 3 of the input unit 1 with a display, combining, as shown in drawing 1 and drawing 2 . Frame flank 2b of a front face 2 is a non-visible region, and center-section 2a is a visible region. The display of a switch etc. is prepared in the display 3 corresponding to center-section 2a, and required data can be inputted into it when an operator presses TTP in the location according to the display of a switch etc.
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EFFECT OF THE INVENTION

[Effect of the Invention] Since use an acrylic binder with sufficient transparency, a crevice is lost between TTP, a transparence plate, or a bright film since complete adhesion of TTP is performed, the Newton ring etc. is not generated and the transparency of TTP is not spoiled, the display of an input unit can check by looking beautifully. Moreover, without a wave occurring in TTP, since it has pasted up completely even if the size of TTP becomes large, a distortion unnecessary at the time of press is not generated, either, but the effectiveness that the life of TTP also becomes long is done so.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Since a distortion unnecessary for TTP was generated when TTP was not completely pasted up on the transparence plate or bright film of surface base material 8 grade of a display, and a clearance existed between TTP, a transparence plate, or a bright film, it inputted by TTP and TTP was pressed, there was a problem of shortening the life of the thin film of TTP. Moreover, the Newton ring etc. is generated, there is also a problem of being easy to spoil transparency, and non-glare processing needed to be performed on the surface of TTP for Newton ring prevention.
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[Translation done.]

12

* NOTICES *

MEANS

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[Translation done.]

13

* NOTICES *

OPERATION

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EXAMPLE

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15

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[0014] Drawing 6 holds the surface base material 8 by the suction chuck 11, and shows the pasted-up procedure which carries out a pressure welding with the press roll 12. The acrylic binder 7 is stuck on the surface base material 8 by carrying out a pressure welding, exfoliating exfoliation film 9b at the superposition press roll 12 to compensate for rotation of ********** and the press roll 12 in the acrylic binder 7 in the surface base material 8 also at this time, where [of exfoliation film 9b] an edge is removed on the other hand.

[0015] Drawing 7 shows the procedure which sticks TTP4 on the surface base material 8 through the acrylic binder 7 with nip rolls 10 and 10, and is united. TTP4 is stuck on the surface base material 8 through the acrylic binder 7 by [of exfoliation film 9a of another side of the acrylic binder 7 stuck on the surface base material 8] passing nip rolls 10 and 10, removing an edge on the other hand and exfoliating exfoliation film 9a to compensate for rotation of ********** and nip rolls 10 and 10 in nip rolls 10 and 10 with TTP4. Since it sticks on coincidence and exfoliation film 9a is united with it, exfoliating, there is no fear of facing sticking and uniting and adhering [Chile / paper powder,].

[0016] Moreover, drawing 8 uses the suction chuck 11 and the press roll 12, and shows the procedure which sticks TTP4 on the surface base material 8. TTP4 is stuck on the surface base material 8 by pressing exfoliating exfoliation film 9a to compensate for rotation of ********** and the press roll 12 on the superposition press roll 12 in TTP4, where [of exfoliation film 9a of the acrylic binder 7 with which it was stuck on the surface base material 8 also at this time] an edge is removed on the other hand.

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16

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[Translation done.]

17

* NOTICES *

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the perspective view using TTP concerning this invention of an input unit with a display.

[Drawing 2] It is the sectional view of the input unit 1 with a display using TTP4 concerning this invention.

[Drawing 3] It is the sectional view of the input unit 1 with a display using conventional TTP4.

[Drawing 4] It is the sectional view of an acrylic binder without a base material.

[Drawing 5] It is the explanatory view showing the procedure which sticks an acrylic binder in the surface base material by the nip roll.

[Drawing 6] It is the explanatory view showing the procedure which sticks an acrylic binder in a surface base material with a suction chuck and a press roll.

[Drawing 7] It is the explanatory view showing the procedure which sticks TTP on the surface base material by the nip roll through an acrylic binder.

[Drawing 8] It is the explanatory view showing the procedure which sticks TTP on a surface base material with a suction chuck and a press roll through an acrylic binder.

[Description of Notations]

1 Input Unit
3 Display
4 Transparence Touch Panel
7 Acrylic Binder

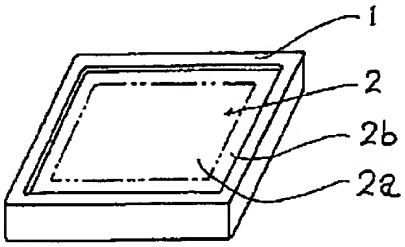
[Translation done.]

18

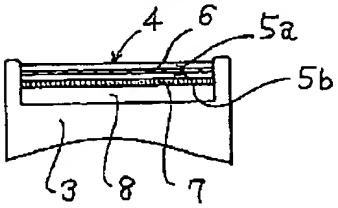
* NOTICES *

DRAWINGS

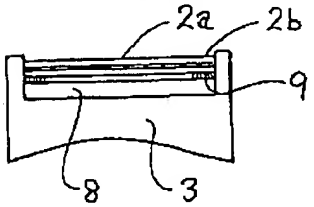
[Drawing 1]



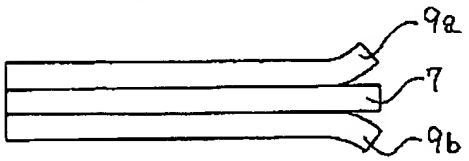
[Drawing 2]



[Drawing 3]

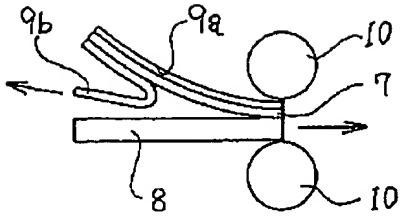


[Drawing 4]



[Drawing 5]

19



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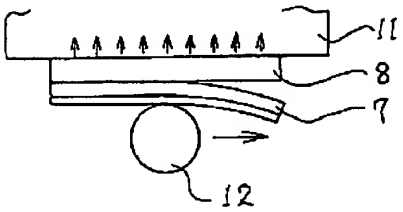
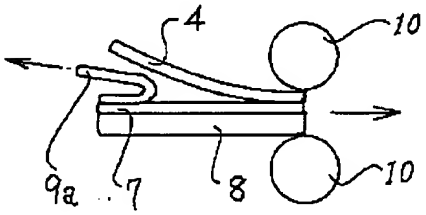
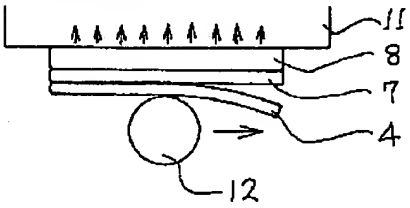


[Drawing 7]



[Drawing 8]



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20